REMARKS

Claims 1-20 are now pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

REQUEST FOR INFORMATION

The Examiner has requested a copy of relevant portions of "Acoustics and Performance of Music" by Jurgen Meyer, discussed at specification page 11 line 23. Applicant respectfully notes that the requested material is provided in an Information Disclosure Statement filed concurrently herewith.

REJECTION UNDER 35 U.S.C. § 112

FIRST PARAGRAPH

Claims 10 and 16 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to claim subject matter described in the application in a manner enabling one skilled in the art to practice the invention. This rejection is respectfully traversed.

The Examiner remarks that claim 10 is not enabled because the specification fails to disclose "a means for simulating musician absorption of the audible sound waves". Applicant respectfully notes that Figure 9 and the specification at page 9, lines 17-19 disclose an absorption panel 75 positioned proximately to and relatively behind a loudspeaker system 71 with respect to a forward direction of the system 71 towards an audience member. Applicant respectfully submits that the specification describes the claimed subject matter in a manner sufficient to enable one skilled in the art to practice the invention. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 10 under 35 U.S.C. § 112, first paragraph.

The Examiner remarks that claim 16 is not enabled because the specification fails to adequately describe a technique for "matching a system overall frequency response to a known overall frequency response". Applicant respectfully notes that Figure 11 and page 11, lines 2-16 disclose adjusting an equalizer so that overall frequency response of a simulation contact recording, measured in one-third octave bands approximates the overall frequency of a microphone recording, wherein the contact recording and microphone recordings were made simultaneously of playing of an instrument selected from an ensemble of instruments. Applicant respectfully submits that the specification describes the claimed subject matter in a manner sufficient to enable one skilled in the art to practice the invention. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 16 under 35 U.S.C. § 112, first paragraph.

SECOND PARAGRAPH

Claims 5 and 16, 17, and 19 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

The Examiner remarks that claim 5 recites subject matter that is not adequately defined in the specification when it recites a "location governed by a cross-correlation function as measured in different frequency bands". Applicant respectfully submits that page 8, lines 4-15 discloses placing contact transducers on separate locations of an instrument, simultaneously recording separate channels for the transducers based on vibrations near the locations, listening to the recordings, and performing measurements

in different frequency bands. Applicant further submits that page 8, lines 4-15 further discloses that these recordings and measurements and performed at different locations and cross-correlated in by any known, suitable, technique, whether mathematical or intuitive (by ear), to select a final location based on a preference for a divergence in frequency between resulting channels of contact recordings. While a selection to place the contact transducers below the an F-hole and under a bridge of the instrument is expressed for an instrument that is a member of a string quartet, the technique may be equivalently applied to other type of instruments as will be readily appreciated by those skilled in the art. Applicant respectfully submits that claim 5 recites subject matter that is adequately defined in the specification. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 5 under 35 U.S.C. § 112, second paragraph.

The Examiner remarks that claim 16 recites subject matter that is not adequately defined in the specification when it recites "matching a system overall frequency response to a known overall frequency response". Applicant respectfully notes that Figure 11 and page 11, lines 2-16 disclose adjusting an equalizer so that overall frequency response of a simulation contact recording, measured in one-third octave bands approximates the overall frequency of a microphone recording, wherein the contact recording and microphone recordings were made simultaneously of playing of an instrument selected from an ensemble of instruments. Thus, matching can be performed, for example, by ear as will be readily understood by one skilled in the art.

The Examiner further remarks that claim 16 recites subject matter that is not adequately defined in the specification when it recites "matching a system coarse asymmetrical frequency response" and "approximating a system fine asymmetrical

frequency response". Applicant respectfully notes that the Jurgen Meyer text referenced in the specification discloses details relating to angular dependence of frequency response, which is termed an asymmetrical frequency response. Applicant further notes that Figure 12 is dedicated to disclosure of the system coarse asymmetrical frequency response matching technique, and that Figure 13 is devoted to disclosure of the system fine asymmetrical frequency response matching technique. Further, the specification at page 10, lines 5-21 discloses matching of the simulation coarse angular frequency to a known coarse angular frequency by using separate loudspeaker drivers, and by selecting loudspeaker piston diameters appropriate to the angular dependence of the instrument. Also, page 12 lines 4-19 further discloses that the fine asymmetrical frequency response approximation is accomplished "by ear", where each speaker of the loudspeaker is given a weighted mixture of bridge and F-hole signals with possible inversion. The weights and decisions to invert for each loudspeaker system corresponding to a particular instrument are thus selected based on user preference to make the loudspeaker system have a fine structure similar to one that might be possessed by an instrument assigned to that loudspeaker system.

Applicant respectfully submits that claim 16, especially as amended, recites subject matter that is adequately defined in the specification. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 16 under 35 U.S.C. § 112, second paragraph.

The Examiner remarks that claim 17 recites subject matter that is not adequately defined in the specification when it recites "selecting an instrument from the ensemble ... simultaneously generating a contact recording and a microphone recording based on

the ensemble sound pattern ... comparing the spectral characteristics of the contact recording and the microphone recording". Applicant respectfully notes that an ensemble sound patterns does not have to be generated by simultaneous playing of the instruments in the ensemble, and that those skilled in the art will recognize the practice of recording musicians of a group separately, followed by mixing of the separate recordings. The present invention significantly differs from the prior art in one respect by declining to mix the different instrument signals into a recording, but feeds the different instrument signals to different sound systems designed to mimic the instruments assigned to them. Therefore, whether the separate instrument portions of the ensemble sound pattern are generated simultaneously or sequentially does not limit the meaning of "ensemble sound pattern" in the present invention.

Notwithstanding, Applicant also respectfully notes that Claim 17 has been amended to recite that the recording is based on a sound pattern generated by playing of the instrument. Applicant respectfully further notes that the step of comparing the spectral characteristics can be performed, for example, "by ear" including listening to the recordings, as will be readily understood by one skilled in the art and further supported in the specification at page 12, lines 18-19. Applicant respectfully submits that claim 17, especially as amended, recites subject matter that is adequately defined in the specification. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 16 under 35 U.S.C. § 112, second paragraph.

The Examiner remarks that claim 19 recites subject matter that is not adequately defined in the specification when it recites "manually adjusting spectral characteristics of the contact recording". Applicant respectfully notes that page 12, lines 20-24 supports

that tight-miking and filtering is an equivalent to use of separate contact transducers to obtain the final instrument signals. The filtering process, which can be accomplished by ear as will be readily recognized by those skilled in the art, is thus one example of a manual adjustment to spectral characteristics of the "contact recording", which is a recording of the assigned instrument absent vibrations caused by simultaneous playing of other instruments in the ensemble. Applicant respectfully submits that claim 19, especially as amended, recites subject matter that is adequately defined in the specification. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 19 under 35 U.S.C. § 112, second paragraph.

CLAIM INTERPRETATION

The Examiner's remarks relating to claim interpretation are respectfully recognized as illustrating one embodiment of the present invention, and Applicant expressly reserves the equivalents to "contact recording", "contact transducer", and "microphone" as specifically disclosed in the specification and as will be readily apparent to those skilled in the art. For example, "contact recording" refers to a recording of the assigned instrument substantially absent vibrations caused by simultaneous playing of other instruments in the ensemble, and with multiple channels having different spectral characteristics. Also, tight-miking combined with filtering is an equivalent to use of separate "contact transducers" to obtain the final instrument signals having different spectral characteristics. Further, "microphone recording" used in contrast to "contact recording" refers to a recording of the mixed spectral characteristics of the instrument or instruments of the ensemble, however obtained.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-4, 7, and 12-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carver (U.S. Pat. No. 4,309,570) in view of Aronis (U.S. Pat. No. 4,175,466) and further in view of Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8, pages 1557-1559. This rejection is respectfully traversed.

Notwithstanding, independent claims 1 and 12 have been amended to recite "a plurality of loudspeaker systems have assigned instruments, with one instrument assigned to one loudspeaker system". In contrast, neither Carver, Aronis, nor Illustrated Oxford Dictionary teach, suggest, or motivate the claimed subject matter. These differences are significant. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of independent claim 1 on these grounds, along with rejection of all claims dependent therefrom.

Claims 5 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carver (U.S. Pat. No. 4,309,570) in view of Aronis (U.S. Pat. No. 4,175,466) and Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8, pages 1557-1559, and further in view of Logue (U.S. Pat. No. 6,279,379). This rejection is respectfully traversed.

The rejection of claims 5 and 15 is respectfully deemed moot in view of respective dependency of claims 5 and 15 from claims considered in condition for allowance as detailed above with respect to rejection of independent claims 1 and 12. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claims 5 and 15 on these grounds.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Carver (U.S. Pat. No. 4,309,570) in view of Aronis (U.S. Pat. No. 4,175,466), Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8, pages 1557-1559, and Logue (U.S. Pat. No. 6,279,379), and further in view of Routine Expedient (MPEP § 2144.04(VI)(C), rearrangement of parts). This rejection is respectfully traversed.

Applicant respectfully notes that Aronis discloses use of only one contact microphone in one embodiment to record vibrations of the entire sounding board. In another embodiment, Aronis discloses using separate "pickups", a term not typically synonymous with use of separate contact microphones, to individually obtain sound from each string of the instrument. Thus, Aronis does not disclose coupling plural contact transducers to obtain different recording channels having different spectral characteristics from a same vibration of the instrument, as is accomplished by the subject matter of claim 6. These differences are significant, and amount to more than a simple rearrangement of parts since an operation of the device of Aronis would be modified by moving the "pickups" to accomplish the claimed subject matter. Further, Applicant respectfully deems the rejection of claim 6 moot in view of its dependency from a claim considered in condition for allowance as detailed above with respect to rejection of independent claim 1. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claim 6 on these grounds.

Claims 8-9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Carver (U.S. Pat. No. 4,309,570) in view of Aronis (U.S. Pat. No. 4,175,466) and Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8,

pages 1557-1559, and further in view of The Computer Science and Engineering Handbook, by Allen B. Tucker, CRC Press, ISBN 0-8493-2909-4, 1996, pages 1557-1559. This rejection is respectfully traversed.

The rejection of claims 8-9 is respectfully deemed moot in view of respective dependency of claims 8-9 from claims considered in condition for allowance as detailed above with respect to rejection of independent claim 1. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claims 8-9 on these grounds.

Claims 10-11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carver (U.S. Pat. No. 4,309,570) in view of Aronis (U.S. Pat. No. 4,175,466) and Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8, pages 1557-1559, and further in view of Sakai (U.S. Pat. No. 4,309,570) and Applicant admission at specification page 10, line 17 referring to "well-known theories for the radiation of a piston in an infinite baffle, a polar pattern". This rejection is respectfully traversed.

Applicant respectfully notes that the "well-known theories" referred to in the specification merely refers to a portion of the system coarse asymmetrical frequency response matching technique relating to selection of speaker driver to approximate a given polar radiation. The assignment of plural instruments to plural speaker systems, one speaker system to one instrument, is therefore not admitted to by the Applicant as known prior to the application. The cited references further fail to disclose this subject matter as claimed in claim 10 and claim 1. These differences are significant. Further, Applicant respectfully deems the rejection of claim 11 moot in view of its dependency

from claims considered in condition for allowance as detailed above with respect to rejection of independent claim 1. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claims 10-11 on these grounds.

Claims 16 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sims (U.S. Pat. No. 5,206,913) in view of Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8, pages 1557-1559. This rejection is respectfully traversed.

Notwithstanding, independent claim 16 has been amended to recite, "employing a plurality of loudspeaker systems assigned to instruments, with one instrument assigned to one loudspeaker system ... using separate loudspeaker drivers in the loudspeaker system ... selecting loudspeaker piston diameters appropriate to an angular dependence of the instrument assigned to the loudspeaker system ... selecting a weight for giving a mixture of instrument signals having different spectral qualities to the loudspeaker system, and ... selecting a frequency-dependent decision to invert the mixture. In contrast, none of the cited references teach, suggest, or motivate the claimed subject matter. Theses differences are significant. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claims 16 on these grounds, along with all claims dependent therefrom.

Claims 17-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sims (U.S. Pat. No. 5,206,913) in view of Illustrated Oxford Dictionary, Oxford University Press, 1998, ISBN 0-7894-3557-8, pages 1557-1559, and further in view of Krauss (U.S. Pat. No. 2,806,953) and Aronis (U.S. Pat. No. 4,175,466). This rejection is respectfully traversed.

The rejection of claims 17-19 is respectfully deemed moot in view of their dependency from claims considered in condition for allowance as detailed above with respect to rejection of claim 16. Therefore, Applicant respectfully requests the Examiner withdraw the rejection of claims 16 on these grounds.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Sept. 5, 2003

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